

THE CLAIMS

What is claimed is:

1. A golf ball comprising:
 - 10 a core;
a layer disposed about the core having a hardness of about 30 Shore D or greater, a flexural modulus of about 1,000 psi to about 80,000 psi, and a thickness of about 0.01 inches to about 0.100 inches, wherein the layer is formed from a thermoplastic composition comprising p-phenylene diisocyanate; and
 - 15 a cover having a hardness of about 20 Shore D or greater, a flexural modulus of about 1,000 psi to about 30,000 psi, and a thickness of about 0.01 inches to about 0.05 inches, wherein the cover is formed from a thermoset material.
2. The golf ball of claim 1, wherein the core comprises a center and an outer core layer, and
- 20 wherein the center has a diameter of about 0.5 inches to about 1.3 inches.
3. The golf ball of claim 1, wherein the thermoplastic composition comprises a reaction product of p-phenylene diisocyanate and at least one hydroxy-terminated curing agent.
- 25 4. The golf ball of claim 3, wherein the at least one hydroxy-terminated curing agent is selected from the group consisting of polyethylene propylene glycol, polytetramethylene ether glycol, polyoxypropylene glycol, ethylene oxide capped poly(oxypropylene) glycol, and mixtures thereof.
- 30 5. The golf ball of claim 3, wherein the at least one hydroxy-terminated curing agent is selected from the group consisting of 1,6-hexanediol-initiated polycaprolactone, diethylene glycol initiated polycaprolactone, trimethylol propane initiated polycaprolactone, neopentyl glycol initiated polycaprolactone, 1,4-butanediol-initiated polycaprolactone, polytetramethylene ether glycol initiated polycaprolactone, and
- 35 mixtures thereof.
6. The golf ball of claim 3, wherein the at least one hydroxy-terminated curing agent is

- 5 selected from the group consisting of poly(phthalate carbonate) glycol,
poly(hexamethylene carbonate) glycol polycarbonate polyols containing bisphenol A, and
mixtures thereof.
7. A golf ball comprising:
- 10 a core; and
at least one cover layer formed from thermoplastic composition having a rebound
resilience of about 40 or greater comprising p-phenylene diisocyanate monomer,
wherein the golf ball has a COR of greater than about 0.76.
- 15 8. The golf ball of claim 7, wherein the golf ball further comprises an intermediate layer.
9. The golf ball of claim 8, wherein the intermediate layer comprises at least one of an
ionomer resin, polyurethane, polyurea, polyamide, highly neutralized polymer,
metallocene catalyzed polymer, or mixtures thereof.
- 20 10. The golf ball of claim 7, wherein the at least one cover layer is an inner cover layer.
11. The golf ball of claim 10, wherein the golf ball further comprises an outer cover layer
disposed about the inner cover layer, and wherein the outer cover layer comprises at least
25 one thermoset material or at least one thermoplastic material.
12. The golf ball of claim 10, wherein the inner cover layer comprises at least two layers.
13. The golf ball of claim 7, wherein the thermoplastic composition comprises urethane
30 linkages.
14. The golf ball of claim 7, wherein the thermoplastic composition comprises a reaction
product of p-phenylene diisocyanate and at least one hydroxy-terminated curing agent.
- 35 15. The golf ball of claim 7, wherein the thermoplastic composition comprises a reaction
product of p-phenylene diisocyanate monomer and at least one amine-terminated curing
agent.

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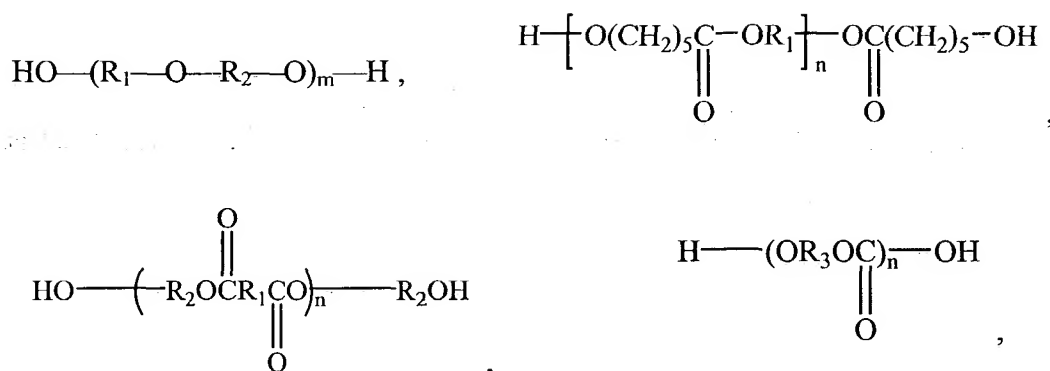
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- 20

5 the group consisting of:



and mixtures thereof, wherein R_1 and R_2 comprise linear or branched hydrocarbon chains having about 1 to about 20 carbon atoms, wherein R_3 comprises at least one phthalate group, at least one hexamethylene group, at least one bisphenol A group, or combinations thereof, wherein m ranges from about 1 to about 45, and wherein n ranges from about 1 to about 25.

20. The golf ball of claim 7, wherein the thermoplastic composition has a hardness of about 40 Shore D.

21. The golf ball of claim 20, wherein the thermoplastic composition has a hardness of about 45 Shore D to about 70 Shore D.

22. A golf ball comprising:

a core;

a layer disposed about the core having a hardness of about 30 Shore D or greater, a flexural modulus of about 1,000 psi to about 80,000 psi, and a thickness of about 0.01 inches to about 0.100 inches, wherein the intermediate layer is formed from a thermoset material; and

a cover having a hardness of about 20 Shore D or greater, a flexural modulus of about 1,000 psi to about 30,000 psi, and a thickness of about 0.01 inches to about 0.05 inches, wherein the cover is formed from a thermoplastic composition comprising p-phenylene diisocyanate.

